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09/749,916	12/29/2000	Jerome S. Hubacek	015290-457	6834

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
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EXAMINER

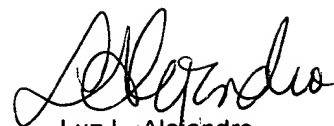
ART UNIT	PAPER
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Commissioner for Patents

A handwritten signature in black ink, appearing to read "Luz L. Alejandro", is positioned above the printed name.

Luz L. Alejandro
Primary Examiner
Art Unit: 1763



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/749,916
Filing Date: December 29, 2000
Appellant(s): HUBACEK ET AL.

Edward A. Brown
For Appellant

EXAMINER'S ANSWER

MAILED
JUN 01 2006
GROUP 1700

This is in response to the appeal brief filed 3/17/06 appealing from the Office action
mailed 7/26/05.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner: the rejection of claims 1, 3-10, 21, 25, 27, 31, 34-35, 37, and 39-40 under 35 U.S.C. § 112, first paragraph.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,074,456	Degner et al.	12-1991
2-20018	Murai	1-1990
5,993,597	Saito et al.	11-1999
5,993,596	Uwai et al.	11-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4-10, 30, 38-39, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Degner et al., U.S. Patent 5,074,456 in view of Murai, JP 2-20018.

Degner et al. shows the invention substantially as claimed including a single crystal silicon showerhead electrode 12 adapted to be mounted in a parallel plate plasma reaction chamber 50 (see figs. 3-4 and table 1) used in substrate processing; the electrode having a thickness in the range from about 0.1 cm to 2 cm and having an RF driven surface on one side thereof (see figs. 3-4) which is exposed to plasma; and a graphite backing confinement ring bonded to the electrode (see col. 5-lines 15-17). For a complete description, see figures 1-4 and their descriptions, specifically col. 1, lines 42-48, col. 2, lines 2-7, col. 4, lines 21-34, col. 5-lines 3-17, col. 5-line 64 to col. 6-line 53.

Degner et al. does not expressly disclose that the electrode is a single crystal silicon electrode having an electrical resistivity of less than 0.05 ohm-cm. Murai discloses a low resistivity electrode 2 adapted to be mounted in a parallel plate plasma reaction chamber 5 (see fig. 1) used in substrate processing, the electrode comprising: a single crystal silicon electrode having an electrical resistivity of less than 0.05 ohm-cm (see page 86, first column, lines 22-26), the electrode having an RF driven surface on one side thereof (see abstract) which is exposed to plasma. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time

the invention was made to modify the apparatus of Degner et al. as to comprise an electrode having an electrical resistivity of less than 0.05 ohm-cm because such electrode structure is known to be suitable to be used in a plasma apparatus.

Concerning the electrode having heavy metal contamination of less than 10 ppm, Degner et al., in col. 3, lines 52-64, discloses that in order to achieve high purity in an electrode the metal contamination should be less than 10 ppm.

Regarding the claimed bonding and clamping structures for securing the electrode to the graphite ring, Degner et al. further discloses that the upper electrode can be secured to backing ring 14 or additional support members 14b, 14c (see fig. 2C) by either a bonding member comprising a joint having an electrically conductive material between the electrode and the support member and which includes an electrically conductive filler (see col. 5, lines 3-17, col. 5-line 64 to col. 6-line 53) or by a clamping member (see col. 8, lines 10-18).

Furthermore, with respect to the showerhead electrode securing structure of claim 10, Degner et al. further discloses a showerhead electrode which is secured to a temperature controlled member in an interior of the plasma reaction chamber, the temperature controlled member including a gas passage for supplying a process gas to the showerhead electrode, a cavity and at least one baffle plate located in the cavity, the gas passage supplying process gas so as to pass through the baffle prior to passing through the showerhead electrode (see col. 7-line 54 to col. 8-line 39, and the figures).

Regarding claim 8 concerning the elastomer being in the form of thin beads, it would have been obvious to one of ordinary skill in the art at the time the invention was

made that a prima facie case of obviousness is established with respect to the shape of the elastomer because the shape of the claimed elastomer is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed elastomer is significant.

Claims 3, 21, 25, 27, 31, 33-37, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Degner et al., U.S. Patent 5,074,456 in view of Murai, JP 2-20018 as applied to claims 1, 4-10, 30, 38-39, and 41 above, and further in view of Saito et al., U.S. Patent 5,993,597.

Degner et al. and Murai are applied as above but do not expressly disclose the claimed diameter of the gas outlets. Saito et al. shows a parallel plate plasma apparatus having an electrode comprising a plurality of bores having diameters of 0.5 mm, 0.020 inch, (see col. 3, lines 15-17, 56-57, and 65-66; col. 5, lines 1-3; and col. 6, lines 14-15). In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the electrode's gas outlets of the apparatus of Degner et al. modified by Murai of the claimed diameter because such a dimension is suitable for gas outlets of a showerhead electrode. Furthermore, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Additionally, where the only difference between the prior art and the claims was a recitation of relative dimensions of

the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

With respect to the outlets of the electrodes comprising ultrasonically drilled holes (claim 27), this represents a process limitation which is not given patentable weight in a claim directed to a product.

Regarding claim 31 concerning the elastomer being in the form of thin beads, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a prima facie case of obviousness is established with respect to the shape of the elastomer because the shape of the claimed elastomer is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed elastomer is significant.

Claims 1, 4-10, 30, 38-39, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murai, JP 2-20018 in view of Degner et al., U.S. Patent 5,074,456.

Murai shows the invention substantially as claimed including a low resistivity electrode 2 adapted to be mounted in a parallel plate plasma reaction chamber 5 (see fig. 1) used in substrate processing, the electrode comprising: a single crystal silicon electrode having an electrical resistivity of less than 0.05 ohm-cm (see page 86, first column, lines 22-26), the electrode having an RF driven surface on one side thereof (see abstract) which is exposed to plasma.

Murai fails to expressly disclose the claimed electrode structure having a thickness of about 0.3 to 0.5 inches and being elastomer bonded to a graphite backing ring, and the silicon electrode being a showerhead. Degner et al. shows a parallel plate electrode apparatus in which the upper electrode is used as a showerhead, has a thickness in the range from about 0.1 cm to 2 cm, and is bonded to a graphite backing ring (see figures 1-4 and their descriptions, specifically col. 1, lines 42-48, col. 2, lines 2-7, and col. 4, lines 21-34). Therefore, in view of these disclosures it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murai as to comprise a showerhead electrode having the claimed thickness and support structure because in such a way a uniform plasma is generated since the gases flow downward, the thickness can be optimized based upon a variety of factors such as the cost of the material, the electrode can be adequately supported, and overlapping ranges between the claims and the reference establish a case of prima facie obviousness see MPEP 2144.05.

Furthermore, Murai does not expressly disclose that the electrode has heavy metal contamination of less than 10 ppm. Degner et al. (col. 3, lines 52-64) disclose that in order to achieve high purity in an electrode the metal contamination should be less than 10 ppm. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of the Murai reference as to comprise an electrode having a metal contamination of less than 10 ppm because this will lead to an electrode having high purity.

Also, Murai does not expressly disclose the claimed bonding and clamping structures for securing the electrode to a support member and a graphite ring bonded to the electrode. Degner et al. further discloses that the upper electrode can be secured to, for example, a graphite backing ring support 14 and additional support members 14b, 14c (see fig. 2C) by either a bonding member comprising a joint having an electrically conductive material between the electrode and the support member and which includes an electrically conductive filler (see col. 5, lines 3-17, col. 5-line 64 to col. 6-line 53 and fig. 2C) or by a clamping member (see col. 8, lines 10-18). In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Murai as to: 1) bond the electrode to the support member and graphite ring as claimed because, for example, the likelihood of breakage of the electrode or debonding from the support member is reduced as is the distortion, and the thermal contact is improved or alternatively 2) as to use a clamping member because such structures are suitable and known for mechanically securing the electrode to the support member.

Furthermore, Murai fails to expressly disclose the showerhead electrode securing structure of claim 10. Degner et al. further discloses a showerhead electrode which is secured to a temperature controlled member in an interior of the plasma reaction chamber, the temperature controlled member including a gas passage for supplying a process gas to the showerhead electrode, a cavity and at least one baffle plate located in the cavity, the gas passage supplying process gas so as to pass through the baffle prior to passing through the showerhead electrode (see col. 7-line 54 to col. 8-line 39,

and the figures). In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the showerhead electrode of the apparatus disclosed by Murai as to be bonded to a temperature controlled member as claimed because in such a way uniform distribution of the processing gases is achieved and the temperature of the electrode can be better controlled.

Murai fail to expressly disclose the backing ring being made of graphite. Degner et al. discloses a backing ring which can be made of graphite (see col. 5-lines 15-17). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electrode of Murai to include a backing ring constructed of, for example, aluminum or graphite, because this will allow for the backing plate to be readily machinable.

Regarding claim 8 concerning the elastomer being in the form of thin beads, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a prima facie case of obviousness is established with respect to the shape of the elastomer because the shape of the claimed elastomer is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed elastomer is significant.

Claims 3, 21, 25, 27, 31, 33-37, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murai, JP 2-20018 in view of Degner et al., U.S. Patent

5,074,456 as applied to claims 1, 4-10, 30, 38-39, and 41 above, and further in view of Saito et al., U.S. Patent 5,993,597.

Murai and Degner et al. are applied as above but do not expressly disclose the claimed diameter of the gas outlets. Saito et al. shows a parallel plate plasma apparatus having an electrode comprising a plurality of bores having diameters of 0.5 mm, 0.020 inch, (see col. 3, lines 15-17, 56-57, and 65-66; col. 5, lines 1-3; and col. 6, lines 14-15). In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the electrode's gas outlets of the apparatus of Murai modified by Degner et al. of the claimed diameter because such a dimension is suitable for gas outlets of a showerhead electrode. Furthermore, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Additionally, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

With respect to the outlets of the electrodes comprising ultrasonically drilled holes (claim 27), this represents a process limitation which is not given patentable weight in a claim directed to a product.

Regarding claim 31 concerning the elastomer being in the form of thin beads, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a prima facie case of obviousness is established with respect to the shape of the elastomer because the shape of the claimed elastomer is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed elastomer is significant.

Claims 1, 3-10, 21, 25, 27, 30-31, and 33-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al., U.S. Patent 5,993,59 in view of Degner et al., U.S. Patent 5,074,456.

Saito et al. shows the invention substantially as claimed including a low resistivity electrode adapted to be mounted in a parallel plate plasma reaction chamber used in semiconductor substrate processing (see col. 1, lines 6-8), the electrode comprising: a single crystal silicon electrode having an electrical resistivity of 0.0001 ohm-cm (see abstract; col. 1, lines 64-65; col. 3, lines 65-67; examples 6-11 of Table 1; col. 4-line 65 to col. 5-line 5; col. 6, lines 10-15; and examples 4 and 7 of Table 2). Since the electrode is used in a parallel plate reactor, it is inherent that the electrode has a surface which is grounded or is coupled to RF power, the surface being exposed to plasma. Furthermore, the electrode comprises a plurality of bores having diameters of 0.5 mm, 0.020 inch, (see col. 3, lines 15-17, 56-57, and 65-66; col. 5, lines 1-3; and col. 6, lines 14-15). It is inherent, in view of this disclosure, that the electrode is being used as a showerhead electrode.

Saito et al. fails to expressly disclose the electrode having a thickness of about 0.3 to 0.5 inches, and the silicon electrode being a showerhead. Degner et al. shows a parallel plate electrode apparatus in which the upper electrode is used as a showerhead and which can have a thickness in the range from about 0.1 cm to 2 cm (see figures 1-4 and their descriptions, specifically col. 1, lines 42-48, col. 2, lines 2-7, and col. 4, lines 21-34). Therefore, in view of these disclosures it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Saito et al. as to comprise a showerhead electrode having the claimed thickness because in such a way a uniform plasma is generated since the gases flow downward, the thickness can be optimized based upon a variety of factors such as the cost of the material, and overlapping ranges between the claims and the reference establish a case of prima facie obviousness see MPEP 2144.05.

With respect to claim 4, Saito et al. does not expressly disclose that the electrode has heavy metal contamination of less than 10 ppm. Degner et al. (col. 3, lines 52-64) disclose that in order to achieve high purity in an electrode the metal contamination should be less than 10 ppm. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of the Saito et al. reference as to comprise an electrode having a metal contamination of less than 10 ppm because this will lead to an electrode having high purity.

Saito et al. is applied as above but lacks anticipation of disclosing the claimed bonding and clamping structures for securing the electrode to a support member.

Degner et al. further discloses that the upper electrode can be secured to, for example, a graphite backing ring support and additional support members by either a bonding member comprising a joint having an electrically conductive material between the electrode and the support member and which includes an electrically conductive filler (see col. 5, lines 3-17, col. 5-line 64 to col. 6-line 53 and fig. 2C) or by a clamping member (see col. 8, lines 10-18). In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Murai as to: 1) bond the electrode to the support member and graphite ring as claimed because, for example, the likelihood of breakage of the electrode or debonding from the support member is reduced as is the distortion, and the thermal contact is improved or alternatively 2) as to use a clamping member because such structures are suitable and known for mechanically securing the electrode to the support member.

Also, Saito et al. fails to expressly disclose the showerhead electrode securing structure of claim 10 and a backing ring elastomer bonded to the electrode as claimed in claim 21. Degner et al. discloses a parallel plate plasma reactor in which a showerhead electrode is secured to a temperature controlled member in an interior of the plasma reaction chamber, the temperature controlled member including a gas passage for supplying a process gas to the showerhead electrode, a cavity and at least one baffle plate located in the cavity, the gas passage supplying process gas so as to pass through the baffle prior to passing through the showerhead electrode (see col. 7-line 54 to col. 8-line 39, and the figures of Degner et al.). In view of these disclosures, it

would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the showerhead electrode of the apparatus disclosed by Saito et al. as to be bonded to a temperature controlled member as claimed because in such a way uniform distribution of the processing gases is achieved and the temperature of the electrode can be better controlled.

Furthermore, Saito et al. fails to expressly disclose the backing ring being made of graphite. Degner et al. discloses a backing ring which can be made of graphite (see col. 5-lines 15-17). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electrode of Saito et al. to include a backing ring constructed of, for example, aluminum or graphite, because this will allow for the backing plate to be readily machinable.

With respect to the outlets of the electrodes comprising ultrasonically drilled holes (claim 27), this represents a process limitation which is not given patentable weight in a claim directed to a product.

Regarding claims 34-36, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Additionally, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, In *Gardner v. TEC Systems*,

Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Regarding claims 8 and 31 and the elastomer being in the form of thin beads, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a prima facie case of obviousness is established with respect to the shape of the elastomer because the shape of the claimed elastomer is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed elastomer is significant.

Claims 1, 3-10, 21, 25, 27, 30-31, and 33-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Degner et al., U.S. Patent 5,074,456 in view of Saito et al., U.S. Patent 5,993,597.

Degner et al. shows the invention substantially as claimed including a single crystal silicon showerhead electrode 12 adapted to be mounted in a parallel plate plasma reaction chamber 50 (see figs. 3-4 and table 1) used in substrate processing; the electrode having a thickness in the range from about 0.1 cm to 2 cm and having an RF driven surface on one side thereof (see figs. 3-4) which is exposed to plasma; and a graphite backing ring elastomer bonded to the electrode. For a complete description, see figures 1-4 and their descriptions, specifically col. 1, lines 42-48, col. 2, lines 2-7, col. 4, lines 21-34, col. 5-lines 3-17, and col. 5-line 64 to col. 6-line 53.

Degner et al. does not expressly disclose that the electrode is a single crystal silicon electrode having an electrical resistivity of less than 0.05 ohm-cm. Saito et al.

discloses a low resistivity electrode adapted to be mounted in a parallel plate plasma reaction chamber used in semiconductor substrate processing (see col. 1, lines 6-8), the electrode comprising: a single crystal silicon electrode having an electrical resistivity of 0.0001 ohm-cm (see abstract; col. 1, lines 64-65; col. 3, lines 65-67; examples 6-11 of Table 1; col. 4-line 65 to col. 5-line 5; col. 6, lines 10-15; and examples 4 and 7 of Table 2). Since the electrode is used in a parallel plate reactor, it is inherent that the electrode has a surface which is grounded or is coupled to RF power, the surface being exposed to plasma. Furthermore, the electrode comprises a plurality of bores having diameters of 0.5 mm, 0.020 inch, (see col. 3, lines 15-17, 56-57, and 65-66; col. 5, lines 1-3; and col. 6, lines 14-15). It is inherent, in view of this disclosure, that the electrode is being used as a showerhead electrode. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Degner et al. as to comprise an electrode having an electrical resistivity of less than 0.05 ohm-cm and a plurality of bores having diameters of 0.5 mm, 0.020 inch, because such electrode structure is known to be suitable to be used in a plasma apparatus. Concerning claims 34-36, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Additionally, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device,

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the claimed device was not patentably distinct from the prior art device, In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Concerning the electrode having heavy metal contamination of less than 10 ppm, Degner et al., in col. 3, lines 52-64, discloses that in order to achieve high purity in an electrode the metal contamination should be less than 10 ppm.

Regarding the claimed bonding and clamping structures for securing the electrode to a graphite ring and a support member, Degner et al. further discloses that the upper electrode can be secured to a graphite ring 14 or additional support members 14b, 14c (see fig. 2C) by either a bonding member comprising a joint having an electrically conductive material between the electrode and the support member and which includes an electrically conductive filler (see col. 5, lines 3-17, col. 5-line 64 to col. 6-line 53) or by a clamping member (see col. 8, lines 10-18).

Furthermore, with respect to the showerhead electrode securing structure of claim 10, Degner et al. further discloses a showerhead electrode which is secured to a temperature controlled member in an interior of the plasma reaction chamber, the temperature controlled member including a gas passage for supplying a process gas to the showerhead electrode, a cavity and at least one baffle plate located in the cavity, the gas passage supplying process gas so as to pass through the baffle prior to passing through the showerhead electrode (see col. 7-line 54 to col. 8-line 39, and the figures).

With respect to the outlets of the electrodes comprising ultrasonically drilled holes (claim 27), this represents a process limitation which is not given patentable weight in a claim directed to a product.

Regarding claims 8 and 31 and the elastomer being in the form of thin beads, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a prima facie case of obviousness is established with respect to the shape of the elastomer because the shape of the claimed elastomer is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed elastomer is significant.

(10) Response to Argument

Appellant argues that Degner et al. does not disclose the claimed thickness of the electrode since Degner et al. does not disclose any specific thickness for any of the respective electrode materials listed in its disclosure at col. 4, lines 10-20. The examiner respectfully disagrees and contends that, as stated in the rejections, Degner et al. clearly discloses that the thickness of the electrode made of the listed materials at col. 4, lines 10-20, range between 0.04 inch to 0.79 inch which encompasses the claimed thickness for the electrode of the instant claimed invention and therefore, a prima facie case of obviousness have been established. Furthermore, it should be noted that overlapping ranges between the claims and the reference establish a case of prima facie obviousness, see MPEP 2144.05.

In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). For example, with respect to the rejection of Degner et al. in view of Murai, appellant states that the thickness of the electrode is not shown by Murai. However, it should be noted that Murai has not been relied upon to show the thickness of the electrode, instead Degner et al. has been relied upon to show such limitation.

With respect to appellant's argument that neither Degner et al. nor Murai recognizes the cracking problem that was solved by the claimed 0.25 inch and thicker electrode, the fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Furthermore, one of ordinary skill in the art would recognize that the thicker an electrode is, the less cracking problems the electrode would have.

In response to appellant's argument that the Murai reference is not combinable with Degner, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would

have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Appellant argues that the Examiner has established no motivation for making the electrode of the apparatus of Degner et al. from the material taught by the Murai reference. The examiner respectfully disagrees and contends that suitability for an intended purpose is a proper motivation, see MPEP 2144.07.

With respect to the second submission of the Hubacek declaration under 37 C.F.R. § 1.132, the fact that a thicker electrode results in a decreased center to edge temperature gradient is an expected result rather than an unexpected result. Moreover, the importance of the specific claimed range of 0.25-0.5 inches has not been demonstrated by the data. Furthermore, appendix B only shows three tested sample and therefore is an extremely small sample from which to draw any conclusions. Moreover, the examiner provided the Uwai et al. reference in order to support the position that the results are expected and not unexpected since the Uwai et al. reference provides support for showing that thicker electrodes have a high heat capacity or smaller temperature gradient (see particularly, col. 4, lines 27-36 of the Uwai et al. reference). However, appellant argues the specific structure of the electrode shown in Uwai et al., but, it should be noted that this reference was cited for the general teaching that a thicker electrode (regardless of the material) will have a smaller temperature gradient. Such a general teaching is clearly shown in the Uwai reference at the cited portions. Concerning appendix C and D which allege by appellant to show unexpected results with respect to the resistivity, applicant should also be aware that not all of the

primary references used in the rejections under 35 USC § 103 lack the particular claimed resistivity. This notwithstanding, the data shown in appendix C and D are insufficient to show unexpected results with respect to the claimed resistivity range.

In response to appellant's argument that the combination of Degner et al. and Murai does not recognize the unexpected advantages provided by the claimed low resistivity silicon electrode, the fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The combination of the Degner et al. reference with the Murai reference discloses the claimed combination of electrode thickness and low resistivity of a silicon electrode, and therefore, it is expected that the advantages recognized by the appellant would be present in the electrode disclosed by the combination of the Degner et al. and the Murai references.

In response to appellant's arguments, the recitation of a confinement ring in independent claims 1, 21 and 30, has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Furthermore, with respect to

appellant arguments regarding claims 39-41, it should be noted that the electrode structure of Degner et al. further comprises a confinement ring 92.

Regarding the 35 U.S.C. 103 rejection of Degner in view of Murai and further in view of Saito, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant argues that the Examiner has established no motivation for making the electrode of the apparatus of Degner et al. to include gas outlets having the diameter taught by the Saito et al. reference. The examiner respectfully disagrees and contends that suitability for an intended purpose is a proper motivation, see MPEP 2144.07.

Regarding appellant's arguments with respect to the rejection under 35 USC 103(a) over Murai in view of Degner et al., it should be noted that the rejections is proper because Degner et al. does not change the principle of operation of Murai since modifying Murai with Degner et al. will still allow for Murai to be used as an electrode consistent with the teachings of Murai. Additionally, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Appellant argues that the examiner has established no motivation for combining the Murai reference with the teachings of the Degner et al. reference. The examiner respectfully disagrees and wants to point out that the motivation to combine the references has been clearly stated in the rejection.

Furthermore, in response to appellant's argument that there is no suggestion to combine the Degner et al. and/or Murai references with the Saito reference, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Saito discloses suitable dimensions for gas outlets of a showerhead electrode.

In response to appellant's arguments with respect to the rejections under 35 U.S.C. 103 of Saito in view of Degner and Degner in view of Saito, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Furthermore, in response to appellant's argument that there is no suggestion to combine the Saito and Degner references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation

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to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the Saito and Degner references is clearly stated in the above and previous rejections.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



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PRIMARY EXAMINER

Conferees:



PARVIZ HASSANZADEH
SUPERVISORY PATENT EXAMINER



GREGORY MILLS
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